BIO-Argo technology

Hervé Claustre, Antoine Poteau, Edouard Leymarie, Fabizio D’ortenzio, Orens Pasqueron de Fommervault, Serge LeReste, Christophe Schaeffer, Arnaud David,
outline

- PROVOR CTS 4 / PROVBIO2
- Sensor calibration & validation
- On going developments related to PROVOR CTS5
PROVOR CTS 4 / PROVBIO2

Up to 5 Zones of sampling

- 0 - 10 m : 0.2 m
- 10 – 250 m : 1 m
- 250 – 1000 m : 10 m
- 1000 - 2000 m : 50 m
Changing depth resolution on purpose; here the backscattering (and Chla) over the 250-1000 m layer.
« High » frequency Measurements at parking depth: here CDOM, Chlorophyll a, backscattering
Float performance: 450 0-1000 m profiles at a daily resolution

http://www.oao.obs-vlfr.fr/carto/index.html
Other example with a full suite of « good » sensors:
Sensors
Pre-deployment cross-comparison of bio-optical sensors (with respect to a “gold” sensor)

OFFSET of 0.08 mg/m³
Possible pressure dependence of the SUNA NO3 sensor
Possible pressure dependence of the SUNA NO3 sensor

South Atlantic Sub tropical Gyre

Med Sea (Levantine basin)
Possible pressure dependence of the SUNA NO3 sensor

Open Niskin bottle
Closed Niskin bottle
New Provor CTS5
CTS4 hardware but new electronic board for new applications

Main features :
✓ Highly flexible script based mission
✓ Capability to accommodate specific user’s payload including feedback commands
✓ Simulation tools for training
✓ Large memory capacity for under ice mission or for extra data in case of float recovery
✓ RUDICS telemetry
✓ Self ballasting, high weight capacity
New Provor CTS5
Highly flexible script based mission

The float’s mission is described with an equation and could be changed easily.
**Classical mission:** 999 cycles with 10 profiles / cycles:
SA->SB->SC->999*(010*(SD->NB->NC->ND->NE->NF->NG->SB->SC))->FN

Mission with speed slow down near surface:
SA->SB->SC->999*(010*(SD->NB->NC->ND->NE->NJ->NK->NG->SB->SC))->FN

Step NF « Ascent to Surface », split into two Part NJ->NK « Ascent standard speed » - « Ascent Low speed »

CTS5 GUI
New Provor CTS5
Highly flexible script based mission

Mission could be modified through Iridium link:
Classically (parameters changed immediately): !param-pattern_01-0:0:true

New: Delayed according to date or cycle number.
Could be very useful for under ice navigation
!wait:01/06/14
!param-pattern_01-0:0:true
!wait-cycle:3
!param-pattern_02-0:0:true
**New Provor CTS5**

**Accommodation of user’s Payload**

The CTS5 support a protocol to communicate with a user electronic board. This protocol allows:

- To exchange data and float’s status
- To have some feedback actions from the user’s Payload onto the float.

LOV has developed a new acquisition board to be interfaced with the CTS5.
New Provor CTS5
Accommodation of user’s Payload

The CTS5 support a protocol to communicate with a user electronic board. This protocol allows:

• To exchange data and float’s status
• To have some feedback actions from the user’s Payload onto the float.

LOV has developed a new acquisition board to be interfaced with the CTS5

Examples of feedback:

• Start or stop a profile in function of weather conditions (estimate with passive acoustic).
• Stop a profile in function of sea-ice probability (ISA, pinger, ...)
• Increase profile frequency in function of measured data (Chla peak).
New Provor CTS5
Simulation tools for training

PC simulator allows user to test Mission’s parameters, Iridium commands and to recover real data files without any risks on your own PC. Simulation could be done 1 to 25 times faster than real time.

a) Float Simulator with files viewer (here CTD data)
b) CTD and dive simulator with viewing of float depth vs time
c) CTD input files
New Provor CTS5
LOV projects ProVal float

The ProVal float is specifically designed to provide daily high accuracy radiometric data for satellite Ocean Color validation exercises.

The ProVal float is specifically instrumented with two identical $E_d - L_u$ combos deported on the side of the float. This configuration will minimize the self-shading.
New Provor CTS5
LOV-Takuvik projects ProIce

Sea-Ice detection (options in study) :  
• ISA 
• Pinger (Active Acoustic) 
• Active light beam (optical Pinger)